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ABSTRACT

Following an introductory description of the structure, administration, and general character of the Soviet system of education, this document discusses the status of educational research and innovation in the USSR. The system of research is outlined, and the organization and areas of inquiry of the major research institutions, including the divisions of the Academy of Pedagogical Science and the Scientific-Research Institute on Problems of the Higher School, are reviewed. Recent educational innovations reported in the document include creating special schools for the gifted in science and mathematics, combining vocational and general education, adding management to the official list of higher education specialties, revising the syllabus of preschool education, providing schools specializing in foreign language instruction, and organizing preparatory departments for higher education. (PGD)

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Education in the U.S.S.R.

Research and Innovation

by

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EA 013 146

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Foreword

This study is one of a series of Office of Education (OE) publications on education in the Union of Soviet Socialist Republics. The major focus is on recent developments and emerging trends in research and innovation in education. The study also includes a helpful summary of the organization and administration of the education system.

Along with two other recent Office of Education publications—"Education in the U.S.S.R.: Recent Legislation and Statistics" (1975), by Seymour M. Rosen, and "Education in the U.S.S.R.: A Bibliography of English-Language Materials, 1965–1973" (1974), by Nellie Apanasewicz—this publication can serve as a valuable guide to several important aspects of contemporary Soviet education. In addition to basic information and perspective on education research and innovation in the U.S.S.R., it contains helpful references to other sources of information for those wishing to pursue further the various subjects covered. This report should therefore prove useful to a wide audience, from those desiring a brief basic orientation to education in the U.S.S.R. to scholars wishing to explore various aspects of Soviet education in greater depth, particularly those concerned with the study of educational change in the Soviet Union.

The author, Seymour M. Rosen, has been a specialist on Soviet education for the Office of Education since 1960. He has made six study trips to the U.S.S.R. since 1961 and is the author of several reports on education in the Soviet Union. Among his reports published by the Office of Education, in addition to the one mentioned previously, are "Education for Career Development in the U.S.S.R." in *International/ Intercultural Education Reports* (1973), "The Development of People's Friendship University in Moscow" (1973), and "Soviet Programs in International Education" (1971).

Robert Leestma
Associate Commissioner for Institutional Development and International Education

November 1977

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1. Introduction: The Soviet System of Education

Education research in the U.S.S.R. consists of the systematic study and analysis of problems in pedagogy and related fields such as child development, educational psychology, and educational administration. In Russian terminology, education research is referred to as *"nauchno-pedagogicheskie issledovanie,"* the "nauchno" prefix indicating the method of "scientific" study or investigation in the field of *"pedagogicheskie issledovanie,"* or education research.

Education innovation in the U.S.S.R. as discussed in this report consists of the application of new methods and programs in the schools. (Education innovation in out-of-school activities, such as those in Pioneer Palaces and People's "Universities" of Culture, are not covered here.) In Soviet terminology, innovation (*novatorstvo*) is described in the "Great Soviet Encyclopedia" (*Bol'shaia Sovetskaia entsiklopediia,* vol. 18, p. 42) as "intending an active utilization of theoretical and practical knowledge . . . and providing material for the application of new theoretical knowledge, furthering the development of science, technology, and production."

In the Soviet system, education research and innovation are under the policy guidelines of the Communist Party of the Soviet Union and the overall direction of one of the two national education ministries, the U.S.S.R. Ministry of Education or the U.S.S.R. Ministry of Higher and Secondary Specialized Education, depending on the field and level of the research or the innovation. Both research and innovation are aimed at improving the general education, upbringing, and specialized training of students within the framework of Communist ideology.

This first chapter provides a brief overview of the educational framework in the U.S.S.R. and the terminology used in describing it. It is intended to provide background knowledge and help clarify the balance of the report for readers unfamiliar with the Soviet education system.[1]

Structure and Administration

Attendance is voluntary in preschool nurseries (for infants through age 2) and kindergartens (for children through age 6). Compulsory

[1] A revised version of the overview in the author's previous study in this series, *Education in the U.S.S.R.: Recent Legislation and Statistics.* HEW/OE 75–19117. Washington, D.C.: U.S. Government Printing Office, 1975.

education begins at grade 1 and, until 1977, included only the period through grade 8 (for children 7 to 15). The system did not include as compulsory the next 2 years of "complete" secondary education (3 years in the Baltic area). The new U.S.S.R. Constitution, published in October 1977, however, declares the right of youth to universal compulsory secondary education as contrasted to the right of an 8-year education specified in the previous constitution, as amended. Thus, although it does not use the term *"complete"* secondary education, the Constitution evidently formalizes the extension of compulsory education from 8 years to 10 (or 11) years.

Although a substantial majority of students complete secondary general education, graduates of grade 8 may instead choose to take vocational education. (See chart.) Higher education ranges in duration from 4 to 6 years depending on the field of study. Tuition is free for education at all levels, and most students at technical and higher schools receive some form of stipend.

The U.S.S.R. Ministry of Education in Moscow and the subordinate ministries of education in each of the country's 15 constituent Republics supervise preschool, elementary, and general secondary education. The research arm of the U.S.S.R. Ministry of Education is the U.S.S.R. Academy of Pedagogical Sciences and its 12 scientific research institutes. Each Republic Ministry of Education also has a research component, called a scientific research institute of pedagogy or pedagogical sciences.

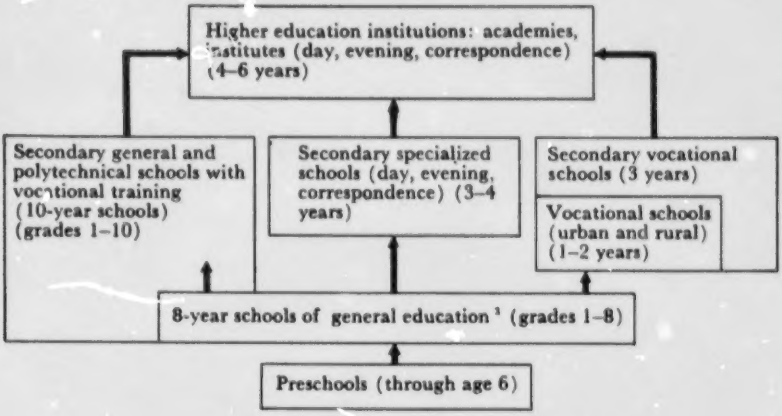
The U.S.S.R. Ministry of Higher and Secondary Specialized Education and its counterparts in the 15 Republics supervise universities and other higher education institutions and secondary specialized schools. The new education research organization of this U.S.S.R. ministry is the Scientific Research Institute on Problems of the Higher School.

In addition, many specialized schools are directly administered by a Government ministry concerned with a particular field. For example, medical schools at both the secondary and higher level are administered by the Ministry of Health, following curriculums approved by the U.S.S.R. Ministry of Higher and Secondary Specialized Education.

The U.S.S.R. Ministry of Education and the U.S.S.R. Ministry of Higher and Secondary Specialized Education are coordinated and controlled in general policy and through specific guidelines, along with other Government ministries, by the Communist Party leadership organs and the U.S.S.R. Council of Ministers, of which both ministries are a part.

A primary function of the Ministry of Higher and Secondary Specialized Education is to fill the Government's quotas for professional and technical manpower, whereas the primary function of the Ministry of Education is to provide a basic general education for the Nation's youth. The State Committee for Vocational-Technical Education of the U.S.S.R. Council of Ministers supervises institutions that train skilled workers for the national economy.

Structure of the Soviet Educational System: 1977


Higher education institutions: academies, institutes (day, evening, correspondence) (4–6 years)
Secondary general and polytechnical schools with vocational training (10-year schools) (grades 1–10)
Secondary specialized schools (day, evening, correspondence) (3–4 years)
Secondary vocational schools (3 years)
Vocational schools (urban and rural) (1–2 years)
8-year schools of general education [3] (grades 1–8)
Preschools (through age 6)

Primary-Secondary Education

Compulsory education begins in the first grade at age 7. Primary education extends from grades 1 to 3, and "incomplete secondary" education from grades 4 to 8. Since 1959 a student progressing through "incomplete secondary" education has been a graduate of an 8-year school (grades 1–8). (Before 1959, he or she was a graduate of a 7-year school.) The upper or "complete secondary" grades are generally 9 and 10; thus a student who has progressed through "complete secondary" education is a graduate of a 10-year school (grades 1–10).

The term "secondary general and polytechnical schools with labor training" refers to the regular 10-year elementary-secondary schools of general education attended by most students. "Polytechnical education," involving knowledge of the world of work, is built into the general education school curriculum from the earliest grades; it includes study of the relationship of the physical sciences to their practical application in industry and also some elementary practical training in specific fields.

Specific vocational training, as distinct from polytechnical education, is given after a student leaves the 8-year school either in 1- to 2-year vocational schools, in the new 3-year secondary vocational schools, or in the 3- to 4-year secondary specialized schools. Examples of the latter are the (lower) medical schools, which produce *"feldshers,"* or doctor's assistants, and the technicums, which train engineering support personnel. These 3- to 4-year secondary specialized schools also include general education in their curriculum and provide access to higher education, though to a more limited extent in practice than do the 10-year schools of general education. General secondary schools grant a maturity certificate (*attes-*

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tat zrelosti) ; secondary specialized and vocational schools grant a diploma (*diplom*).

Higher Education

Only a small percentage of the students in higher education are enrolled in the Soviet Union's 60-plus universities. The great majority are in the more than 700 specialized institutes that produce engineers, teachers, doctors, and various other professionals. Length of study for a diploma is 4 years (generally) for teachers, 5 years for engineers, and 6 for medical doctors. All professional training follows immediately upon 10 or 11 years of elementary-secondary education. There is no equivalent to the U.S. bachelor of arts studies prior to professional training in such fields as law and medicine.

A prime objective of Soviet higher education is to make each student a trained and appropriately indoctrinated specialist in a given field. In accordance with the state's plans for trained manpower, students are admitted to a coded, numbered specialty in higher education that corresponds to the same numbered specialty in industry or in medical, legal, or other fields.

Almost half of all higher education students work fulltime, being enrolled in either evening or correspondence-extension programs. Of these students, about two-thirds are in correspondence-extension programs. Both programs are alternative roads to a higher education diploma for those not entering full-time day programs. Correspondence program specialties are generally related to full-time fields of work, and workers get paid time off from their jobs to take exams.

Graduate study, called the *aspirantura*, generally lasts for 3 years and leads to the *kandidat nauk* or candidate of sciences degree. About 40 percent of the graduate students are trained in research organizations rather than higher education institutions. Thus the various scientific research institutes described in this study may offer some graduate training as well as conduct education research.

2. Research

The National System of Education Research

Education research in the U.S.S.R. is carried out in the following state institutions:

1. Scientific research institutes that are part of the Academy of Pedagogical Sciences, which is under the U.S.S.R. Ministry of Education; and scientific research institutes of pedagogy that are attached to the individual Republic ministries of education but conduct research that is coordinated by the Academy of Pedagogical Sciences.
2. The Scientific Research Institute on Problems of the Higher School, which is under the U.S.S.R. Ministry of Higher and Secondary Specialized Education.
3. Universities, technical institutes, and pedagogical institutes (higher education institutions, not to be confused with the research institutes of pedagogy listed as the first type of education research institution).

Overall coordination of education research is the responsibility of the Academy of Pedagogical Sciences, or more specifically of its Coordination Council, which consists of education research directors from various areas throughout the country. The recently established Scientific-Research Institute for the Study of Problems of the Higher School, unlike the other national education research institutes, appears to be independent of the Academy, having its own Coordination Council and Coordination Plan.

Education research throughout the U.S.S.R. is classified under a national system that is intended to simplify accounting, analysis, and information collection on research into 16 areas or "directions" (*napravlenii*), each of which is divided into subgroups or "problems" (*problemy*). The research areas are: [1]

1. Methodological problems of pedagogy.
2. History of the development of pedagogical thought and public education in the U.S.S.R.
3. Planning, organization, and economics of public education.
4. Educational psychology problems of raising preschool children.
5. Problems of the Communist indoctrination of students.
6. Problems of didactics and special methods.
7. School equipment and technical educational devices.

[1] V. S. Gribov. "Coordination and Information," *Sovetskaia pedagogika* (Soviet Pedagogy). March 1975, pp. 110–18. (U.S. Joint Publications Research Service [JPRS], "Translations on U.S.S.R. Political and Sociological Affairs," no. 629, May 6, 1975, pp. 46–55.)

8. Development problems of the national school.
9. Problems of general social psychology and psychophysiology.
10. Problems of age and educational psychology and psychological bases of education and training.
11. Problems of age physiology and school hygiene.
12. Improving the training and educational process for physically or mentally defective children.
13. Pedagogical problems of adult education.
14. Training and advanced training of pedagogical personnel; and problems of higher and secondary pedagogical education.
15. Problems of vocational and technical education.
16. Pedagogy and the school abroad.

The following example shows the subgrouping or "problems" classification for the first research area listed—"methodological problems of pedagogy":[2]

1. Methodology of pedagogy as a system of scientific knowledge.
2. Scientific and technical revolution, social progress, and pedagogy.
3. Methodology and methods of pedagogical research.
4. Critical analysis of modern bourgeois pedagogical concepts.
5. Scientific problems of pedagogy; and raising the effectiveness of scientific educational research.
6. Scientific information in the area of public education, pedagogy, and psychology.
7. Theoretical bases and principles of polytechnical education under the conditions of scientific, technical, and social progress

Although in some instances it is clear that a national institute has a major concern with a specific research area, each institute does not handle one particular area exclusively. Several institutes may be involved in one area, or one institute in several areas.

The U.S.S.R. Academy of Pedagogical Sciences has noted in its official publication the problem of coordinating education research in the various institutions:

> Analysis of the plans received from the institutions as well as the initial version of the summary plan often discloses substantial shortcomings. Most often these are expressed in the unimportance of the subject being planned, the exceeding of work times, the repetition of previously executed research, and an unjustified duplication of subjects.[3]

The classification system is used not only to keep track of past research and research in progress, but also to coordinate plans for future research under a system of annual and 5-year plans (e.g., 1971–75, 1976–80). Each institution involved in education research submits on standard forms its tentative research plans, which are reviewed and commented on by the Academy's Coordination Council and revised accordingly by

[2] Ibid.
[3] Ibid. (JPRS, p. 48.)

the institution to form part of the "summary research plans" at the national level. The summary plans are grouped by area and problem.

Data on planned research projects include the title of the problem, the aims and nature of the research, the names and affiliations of the researchers, the period of the planned research, the expected results, and the means for introducing the results into educational practice. The system allows for changes in a research project as the research proceeds.

A small percentage of the research projects in the summary plans are included in the "Coordination Plan," which consists of research considered most important for the country by the U.S.S.R. Academy of Pedagogical Sciences. These projects are incorporated into the plans of the national research institutes and are carried out under their direction and with their participation, jointly with the appropriate researchers in local Republic pedagogical research institutes, universities, and pedagogical institutes.

In the 1971–75 5-year plan, there were about 300 institutions and 26,000 researchers ("executors") carrying out over 6,400 education research projects. In the 1976–80 plan, the number of research projects has been reduced by 40 percent to focus on those considered most significant and timely.

The Academy of Pedagogical Sciences

The chief institution for education research in the Soviet Union is the national U.S.S.R. Academy of Pedagogical Sciences (*Akademiia pedagogicheskikh nauk S.S.S.R–APN*). Membership in the Academy indicates the highest level of professional standing for an education researcher, equivalent in the education field to membership in the prestigious U.S.S.R. Academy of Sciences in the science field.

The APN became a national institution in 1966, when the APN of the Russian Soviet Federated Socialist Republic (R.S.F.S.R.) was upgraded to U.S.S.R. status under the newly formed U.S.S.R. Ministry of Education. The APN has a president (V. N. Stoletov), three vice presidents (M. I. Kondakov, A. V. Petrovskii, and A. G. Khripkova), and a chief scientific secretary (I. F. Protchenko). These officers, along with seven other APN members, form the governing Presidium of the APN.[4]

The Council for the Coordination of Scientific Research in the Area of Pedagogical Sciences in the U.S.S.R., or simply the Coordination Council, was formed in December 1968 under the Presidium of the APN. Its membership includes the leaders of the APN, the directors of its research institutes, directors of Republic pedagogical research institutes, and

[4] The APN's leadership was elected, or reelected, in April 1976; those named here and in table 1 as division academician-secretaries were elected at that time and reported in *Sovetskaia pedagogika*, no. 6, June 1976, p. 156. A somewhat dated list of APN members and their specialties appears in "The World of Learning," 1975–1976, vol. II, pp. 1132–33.

Table 1.—Organization of the Academy of Pedagogical Sciences: 1976

Division (*Otdelenie*)	Institute (*Institut*)	Division academician-secretary or institute director (when known)[1]
Didactic and Special Methods		I. D. Zverev
	Content and Methods of Instruction (*soderzhaniia i metodov obucheniia*)	M. P. Kashin
	General Education of Adults (*obshchego obrazovaniia vzroslykh*)	A. V. Darinskii
	Russian Language in National Schools[2] (*russkogo iazyka v natsional'noi shkole*)	N. M. Shanskii
	School Equipment and Technical Means of Instruction[3] (*shkolnogo oborudovaniia i tekhnicheskikh sredstv obucheniia*)	S. G. Shapovalenko
Pedagogy and Psychology of Vocational-Technical Education		S. Ya. Batyshev
	Labor Training and Vocational Guidance (*trudogo obucheniya i proforientatsii*)	.....
Psychology and Growth Physiology		A. A. Bodalev
	Defectology[4] (*defektologii*)	T. A. Vlasova
	General and Educational Psychology (*obshchei i pedagogicheskoi psikhologii*)	N. A. Menchinskaia
	Physiology of Children and Adolescents (*fiziologii detei i podrostkov*)	.....
Theory and History of Pedagogy		Yu. K. Babanskii
	Artistic Education (*khudozhestvennogo vospitaniia*)	B. T. Likhachev
	General Pedagogy (*obshchei pedagogiki*)	A. M. Arsen'ev
	General Problems of Upbringing (*obshchikh problem vospitaniia*)	G. N. Filonov
	Preschool Education (*doshkol'nogo vospitaniia*)	A. V. Zaporozhets

[1] See text footnote 4, p. 7.
[2] Schools of the non-Russian nationalities.
[3] Audiovisual aids and programed learning.
[4] Education of the physically and mentally handicapped.
Source: *Sovetskaia pedagogika*, various issues in 1975 and 1976.

prominent scientists—a total of about 60 members. (Each of the Soviet Republics, in turn, has a Coordination Council for education research.)

The U.S.S.R. Council monitors ongoing education research throughout the country, examines plans and considers prospects for future research, makes corresponding recommendations to the Presidium of the APN, compiles coordination plans for the most important research, initiates conferences and exchanges of information on major problems, and provides national liaison between and among the various education research organizations and institutions.

The APN's 12 scientific research institutes are grouped in 4 divisions. (See table 1.) The largest, the Division of Didactics and Special Methods, has about 60 members and supervises 4 research institutes (*Nauchno-issledovatel'skie instituty*) of the Academy. The Division of Theory and History of Pedagogy has about 40 members and supervises 4 research institutes. The Division of Psychology and Growth Physiology has about 20 members and supervises 3 institutes. And the Division of Pedagogy and Psychology of Vocational-Technical Education, established as recently as 1973, has only one institute under its direction.

In addition to its research institutes, the APN has a major Soviet library and a publishing house. The library is called the State Scientific and Pedagogical Library for National Education *imeni* (named for) K. D. Ushinsky. The publishing house, *Pedagogika*, issues a large number of individual education works and also the Academy's six professional journals—*Sovetskaia pedagogika* (Soviet Pedagogy), *Voprosy psikhologii* (Problems of Psychology), *Sem'ya i Shkola* (The Family and School), *Russkiy iazik v natsional'noi shkola* (The Russian Language in the National School), *Defektologiia* (Defectology), and *Kvant* (Quantum).

Table 1 lists the 4 divisions with their respective academician-secretaries and the 12 research institutes with their directors (when known). The following are some of the functions and recent activities[5] of the Academy, by division:

Division of Didactic and Special Methods

Institute of Content and Methods of Instruction: Preparation of new curriculums, syllabuses, and textbooks in physical sciences, social sciences, and humanities; and recently, preparation not only of methods manuals for required subjects, but also of teaching guides for optional courses.

Institute of General Education of Adults: Preparation of recommendations for improvement of general secondary education of adults; research on organization of admissions, organization and methods of teaching, and problems of retention of students in evening and correspondence schools.

[5] For details and monographs on specific recent activities such as names of many of the textbooks, authors or editors, and subjects by grade, or numbers of texts and teachers guides produced at the various APN institutes, see *Sovetskaia pedagogika*, June 1973, July 1975, and July 1976. An abridgement of this information in *Sovetskaia pedagogika*, July 1975, has been translated into English in the U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs" no. 684, Oct. 8, 1975, pp. 6–19.

Institute of Russian Language in National Schools: Establishment of lexicological, phraseological, and grammatical standards; preparation of training aids; and convening of conferences on teaching Russian as a second language to students in non-Russian schools in the U.S.S.R.

Institute of School Equipment and Technical Means of Instruction: Research on various aspects of utilization of school equipment, audiovisual aids, and other technical means in the study of Russian and foreign languages, the physical and social sciences, etc.; creation of model-school study rooms or technical centers using movies, radio, and television; and testing of new equipment.

Division of Pedagogy and Psychology of Vocational-Technical Education

Institute of Labor Training and Vocational Guidance: Preparation of curriculums, syllabuses, and teachers guides for various types of polytechnical and work training for pupils in urban and rural schools, in recent years emphasizing materials for grades 4–10 in rural schools; and professional orientation (i.e., vocational guidance) research involving generalization of the experience of schools considered outstanding in the field.

Division of Psychology and Growth Physiology

Institute of Defectology: Study of problems of pedagogy and psychology of physically and mentally handicapped children, and their training and upbringing; introduction of research results into practice in syllabuses, textbooks, and methods in special schools. Recent work on a program for instruction and upbringing of preschool age children with various kinds of handicap.

Institute of General and Educational Psychology: Assessment of knowledge and mental development of students in the new school programs; study of psychological problems of increasing the level of theoretical education in urban and rural schools; continued research into the problems of programed learning as a means of developing active and independent thinking; research in problems of forming a world view and the personality of pupils; research in the psychology and aptitudes of students.

Institute of Physiology of Children and Adolescents: Research and conferences on problems of physical education and hygiene, physical development, and the health of children related to the school routine and study load in urban and rural schools; study of the functioning of the central nervous system in various stages of ontogenesis, the metabolic processes, the physiology of mental activity, and the adaptation of schoolchildren to changing environmental conditions.

Division of Theory and History of Pedagogy

Institute of Artistic Education: Research and recommendation of new syllabuses in pictorial and dramatic arts and in music for grades 1–10; development of esthetic taste in pupils in urban and rural schools and preparation of monographs on the subject; experimental testing of new art and music courses and extracurricular activities.

Institute of General Pedagogy: Research on shaping a Communist world view in school pupils; study of problems in the history of prerevolutionary Russian and Soviet schools and of schools abroad; preparation of publications criticizing modern and contemporary bourgeois pedagogy in foreign schools; improvement of information service in education;[6] and preparation of a glossary of key words in education.

[6] For information concerning U.S.S.R. educational information services, see: International Bureau of Education (IBE), Documentation Office. *IBEDOC Information*, no. 9, June 1977, pp. 8–10.

Institute of General Problems of Upbringing:[7] Preparation of recommendations and publications on methods of moral and patriotic upbringing, development of socially active students, work of class leaders, and organization of out-of-class and out-of-school upbringing activities of youth groups—the Pioneers and *Komsomol.*

Institute of Preschool Education: Research on the pedagogy and psychology of preschool children, having developed a widely used syllabus for upbringing in the kindergarten; recent development of teachers' aid materials considering problems of physical, mental, moral, and esthetic upbringing of all preschool age groups; work on methods of diagnosing mental development and preparation of 6-year-olds for the first grade.

Various weaknesses of the Academy and its research institutes have been noted elsewhere,[8] including emphasis on pedagogical practices and instruction in methods rather than on results of experimental investigation (seen in the voluminous output of papers and publications on the former subjects) and the uneven quality and significance of the research carried out.

Criticism is generally reported in various issues of the Academy's journal *Sovetskaia pedagogika,* either in articles by Academy officials or in reports of APN Presidium meetings. In the August 1976 issue (p. 153), the journal itself was criticized by the Presidium for serious defects, including the fact that "the journal does not deal adequately with problems of methodology and methods of pedagogical research, fundamental problems of the theory of training and Communist upbringing, problems of the connection of theory with practice, and the economics and management of public education."

In addition to being directly responsible for its 12 research institutes, the Academy coordinates the work of pedagogical research institutes attached to each of the Republic ministries of education.

The Scientific-Research Institute on Problems of the Higher School

Although research in higher education teaching and administration has been carried out in the past in various Soviet higher education institutions, until recently there has been no national research institution under the U.S.S.R. Ministry of Higher and Secondary Specialized Edu-

[7] Upbringing (*vospitanie*) is an important educational concept in the U.S.S.R. It is "the process of purposeful, systematic formation of the personality with the goals of preparing it for active participation in society, production, and cultural life. . . . Upbringing is carried out jointly by the family and school, preschool, and out-of-school organizations, children's, and youth groups." *Bol'shaia Sovetskaia entsiklopedia* (The Great Soviet Encyclopedia). Moscow: "Soviet Encyclopedia" Publishers, 1971. 5:380. "In conditions of socialism, upbringing has the goal of formation of Communist consciousness and behavior, comprehensive development of the personality, and preparation of active and conscious builders of Communism." *Pedagogicheskaia entsiklopedia* (Pedagogical Encyclopedia). Moscow: "Soviet Encyclopedia" Publishers, 1964. 1:383.

[8] See Herbert Rudman's "The School and State in the U.S.S.R." (New York: Macmillan), pp. 223–28, and the author's "Education and Modernization in the U.S.S.R." (Reading, Mass.: Addison-Wesley), pp. 56–57.

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cation. (The Academy of Pedagogical Sciences is under the U.S.S.R. Ministry of Education and is primarily responsible for the elementary and secondary school levels.) In 1973 such an institution was founded—the Scientific-Research Institute on Problems of the Higher School (*Nauchnoissledovatel'skii institut problem vysshei shkoly*)—and began to function the following year.[9] The Russian acronym for this research institute is NIIVSh.

The institute has a director (V. N. Chetverikov), two deputy directors for scientific questions (A. Ya. Savelev and V. M. Kuznetsov), a deputy director for administration (V. V. Ozerov), and an academic secretary (V. N. Volkova).[10] The institute consists of 10 departments (*otdely*), each divided into sectors (*sektory*), as listed in table 2.

In addition, a Division of Computer Technology (*Otdelenie vyschislitel'noi tekhniki*) is provided for in the organization of the institute. The division head is N. M. Kogdov.

In research support of the mission of the U.S.S.R. Ministry of Higher and Secondary Specialized Education, the institute is not only concerned with higher education but has a department specifically concerned with secondary specialized education. Also, the U.S.S.R. Minister of Higher and Secondary Specialized Education reported that both the Scientific Research Institute on Problems of the Higher School and the U.S.S.R. Academy of Pedagogical Sciences have been charged with conducting an in-depth study of the problems of the secondary specialized school.[11]

Table 2 shows a separate sector for study of the experience of "foreign higher schools" as well as one for information about them. Similarly, under the U.S.S.R. Academy of Sciences Division of Theory and History of Pedagogy, there is a Sector of Comparative Education and Schools Abroad. Both the APN and NIIVSh have considerable interest in education and education research in the United States, and in early 1977 the institute had a study in draft on U.S. higher education. As noted earlier, 1 of the 16 pedagogical research areas under the nationally coordinated Soviet classification system is Pedagogics and the School Abroad.

Among the main tasks of the institute are (1) defining the problems that lend themselves to early resolution for raising the quality of specialist training, (2) carrying out research on these problems, (3) coordinating work on complex problems among higher education institutions

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[9] *Vestnik vysshei shkoly* (Bulletin of the Higher School), no. 2, February 1975, pp. 10–14, and no. 3, March 1975, pp. 7–13. The latter article by the first director of the institue, Doctor of Technical Sciences, Professor V. N. Chetverikov, is translated in the U.S. JPRS' "Translation on U.S.S.R. Political and Sociological Affairs," no. 628, May 2, 1975, pp. 88–96.

[10] The institute published a prospectus in October 1976 which contained the names of its leadership and department heads.

[11] Source: *Sredneye spetsialnoe obrazovanie* (Secondary Specialized Education), no. 4, April 1975, pp. 5–15 (U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs," July 3, 1975, pp. 13–28).

Table 2.—Organization of the Scientific-Research Institute of Problems of the Higher School: 1976

Department (*Otdel*)	Department head [1]	Sector (*Sektor*)
Administration (*upravleniia*)	T. I. Umonova	Automated System of Administration of [Within] a Higher School. Automated Systems of Administration of *VUZy* (Higher Education Institutions). Automated Systems of Planning Estimates. Mathematical Verification of Automated Systems of Administration.
Communist Upbringing of Students (*kommunisticheskogo vospitaniia studenchestva*)	D. V. Nikolaevich	Forms and Methods of Teaching Social Sciences. Sociopolitical Practices. Theory and Organization of Communist Upbringing.
Forecasting Development of Higher Education (*prognozirovanii razvitiia vysshego obrazovaniia*)	B. A. Burak	Development and Methodology of Planning for Training Specialists. Methodology of Planning of Development and Distribution of *VUZY* for Republics and Economic Regions. Methodology and Study of the Demand for Specialists.
International Experience of Preparation of Specialists (*mezhdunarodnogo opyta podgotovki spetsialistov*)	A. P. Akat'ev	Study of the Experience of Foreign Higher Schools. Study of Training Cadres for Foreign Countries.
Organization of Scientific Research (*organizatisii nauchnykh issledovanii*)	Ya. Yu. Petrovich	Planning [and Organization] of Research. [Organization of the] Research Work of Students.
Problems of Economics of Higher Education (*problem ekonomiki vysshego obrazovaniia*)	A. N. Konovalov	Development of the Material-Technical Base of Higher Educational Institutions (*VUZY*). Problems of Economics of Higher Schools. Scientific Development of Standardized Material. Scientific Organization and Standardization of Work. Socioeconomic Problems of the Training of Specialists.
Problems of Secondary Specialized Education (*problem srednego spetsial'nogo obrazovania*)	N. I. Ivanovich	Development of Secondary Specialized Education. Scientific Organization of the Teaching Process.

See footnote at end of table.

Table 2.—Organization of the Scientific-Research Institute of Problems of the Higher School: 1976—Continued

Department (*Otdel*)	Department head [1]	Sector (*Sektor*)
Scientific Information (*nauchnoi informatsii*)	E. N. Zamurev	Data Bank and Operative Information. Information About Foreign Higher Schools. Information for Economics and Planning of Training of Specialists. Information for Organization of the Teaching Process and Application of New Methods. Information on Scientific Research on Problems of the Higher School. Methodology of Scientific-Technical Information in *VUZy*. Technical Means of Information.
Scientific Organization of the Teaching Process (*nauchnoi organizatsii uchebnogo protsessa*)	N. A. Vasilévich	Educational Films and Television. Instructional Systems. Mathematical Modeling Related to the Training of Specialists. Planning and Control of the Teaching Process. Scientific Organization of Libraries and Bibliographies.
Theory and Methods of Instruction. (*teorii i metodiki obucheniia*)	T. V. Kudriavtsev	Didactics. Educational Growth and Psychology. Evening, Correspondence, and Post-Diploma Study. Organization of Admissions and Professional Orientation. Physiology and Hygiene of Mental Activity. Production Training and Practice.

[1] See text footnote 10, p. 12.

Source: An organizational chart presented to the author by the institute in October 1976.

and between them and other research organizations, and (4) coordinating research planning for the 1976–80 period.[12]

[12] In July 1976, the institute published its "Coordination Plan for Scientific Research on Problems of Higher and Secondary Specialized Education for 1976–1980" (*Koordinatsionnyi plan nauchno-issledovatel'skikh rabot po problemam vysshego i srednego spetsial'nogo obrazovanii na 1976–1980 gg.*). (Moscow, 1976, 189 pp.)

As a new research organization, the institute is studying the experience in education research of various higher education institutions and the Academy of Pedagogical Sciences. According to its director, the institute is adopting a systems analysis approach in selecting problems for research, including such criteria as the urgency of the problem for improving the teaching process and administration in higher schools, the complexity of the problem, the probability of success, and the practical aspects of adequate resources to tackle the problems.[13]

The institute's Coordination Plan is divided, in descending order of subordination, into "directions" (*napravlennii*), "complex problems" (*kompleksnye problemy*), "problems" (*problemy*), and "themes" (*temy*). The two main directions with their complex problems are as follows:

Training and Communist Upbringing of Students of Higher and Secondary Specialized Educational Institutions

1. Demand for graduates of higher and secondary specialized educational institutions.
2. Content of study and forms of its realization in curriculums and syllabuses.
3. Content of the process of Communist upbringing of students and forms of its realization.
4. Measurements, principles, and methods of training and upbringing.
5. Research problems of developing and applying the means of study.
6. Professional orientation (vocational guidance), occupational selection, and organization of admissions in higher and secondary specialized education institutions.
7. Prospects for development of training and upbringing.

Administration of the Higher School, Organization of Scientific Research, Economics of Higher Education, and Forecasting the Development of Higher and Secondary Specialized Education

1. Goals of the system of administration of higher and secondary specialized schools.
2. Content and organization of forms of administration of activity for training specialists.
3. Content and organization of forms of administration of scientific activity.
4. Content and organization of forms of administration of activity for training scientific-pedagogical personnel.
5. Content and organization of forms of administration for financial and economic activities.
6. Automated system of administration of the higher school.
7. Development of the U.S.S.R. education system.

The Coordination Plan is set up in six columns, the first identifying specific research projects by an "index" or numbering system, the second naming the complex problems and subordinate problems, the third citing the themes, the fourth naming the institution(s) that will carry out the research, the fifth indicating the time period of the research, and the

[13] *Vestnik vysshei shkoly*, no. 2, February 1975, p. 8.

sixth very briefly noting the "expected results of the research," such as a "report," a "monograph," or "recommendations."

While the Coordination Plan, published in July 1976, cites two directions, the prospectus of the Institue (simply entitled "Scientific-Research Institute for Problems of the Higher School"), published in October 1976, also lists a third direction; namely, Scientific-Technical Information in the System of Higher and Secondary Specialized Education. The six complex problems cited under this direction are:

1. Information demands of higher schools.
2. Content and form of information supply to the higher school system.
3. Methods of developing analysis and synthesis of information in the higher school.
4. Principles and methods of creation of a unified information bank in the higher school system.
5. Methods and means of mechanization and automation of information processes in the higher school system.
6. Development of the system of scientific-technical information of the higher school.

In the relatively brief period of operation of the new institute, it was apparently soon realized (although probably after development of the institute's first Coordination Plan) that developing effective systems of collection and dissemination of research findings was of equal importance with carrying out education research.[14]

Including the third direction, the institute is studying a total of 20 complex problems and over 500 education research themes.

Research in Higher Education Institutions

A number of universities and technical institutes have been mentioned in connection with research on particular problems of higher education. Some of these are:[15]

Research Subject	*Institutions*
Automation of Administration Systems	Moscow Power Institute; Tomsk Polytechnical Institute; Kharkov Aviation Institute; People's (Lumumba) Friendship University.
Economics of Higher Education	Moscow State University; Leningrad Polytechnical Institute; Belorussian Institute of the National Economy.

[14] Readers may note a general similarity to American experience, wherein the importance of the dissemination function is a rather recent phenomenon in educational research and development, having become a national priority only in the past 20 years.

[15] *Vestnik vysshei shkoly*, no. 3, March 1975, pp. 11–12.

Research Subject	*Institutions*
Organization of Research Planning	Moscow Aviation Institute; Moscow Higher Technical School; Gorky State University.
Organization of Research by Students	Tomsk Polytechnical Institute; Leningrad Engineering-Economics Institute; Moscow Institute of the Oil, Chemical, and Gas Industries.

Pedagogical institutes, which are the U.S.S.R. teachers colleges for training elementary and secondary school teachers, are also engaged in education research. The 200 institutes have enrollments totaling about 300,000 and an instructional staff of more than 45,000. Among the staff are about 2,500 who might be considered senior teaching and research personnel, about 700 professors and doctors of science, and 13,500 docents (assistant professors) and candidates of science.

Elementary-secondary education research in these institutes is carried out in problem laboratories (*problemnye laboratorii*), which are concerned with special research subjects. There are 15 major problem laboratories in the largest pedagogical institutes of Moscow, Leningrad, Baku, and Erevan. The following are some specific areas of education research and the institutes where the research is being carried out:[16]

Research Subject	*State Pedagogical Institute*
Economics of Education	Moscow Pedagogical Institute.
Educational Television	Leningrad Pedagogical Institute.
Environmental Education	Moscow and Dzhambul Pedagogical Institutes.
Growth Physiology	Azerbaidzhan Pedagogical Institute.
Problems of Rural Schools	Smolensk Pedagogical Institute.
Career Guidance of Youth	Kiev and Minsk Pedagogical Institutes.
Planning and Financing of Education	Chelyabinsk, Yaroslave, and Tiraspol' Pedagogical Institutes.
Preventing Student Failures and Repeaters	Rostov Pedagogical Institute.

[16] *Vestnik vysshei shkoly*, no. 1, January 1974 pp. 37–40.

Some defects in research in the pedagogical institutes have been indicated by V. K. Razor, Chief of the Administration of Educational Institutions, U.S.S.R. Ministry of Education.[17] In several institutes the basic direction of research has not been defined, and much of the work is on themes of little significance. Effective research is hampered by slowness in establishing strong research groups, working on complex themes, and important methodological problems. Effective cooperation is lacking between many pedagogical institutes and the U.S.S.R. Adademy of Pedagogical Sciences, its research institutes, and the various Republic research institutes and pedagogical institutes. The results of research are introduced into school practice too slowly. In addition, problems exist with quality of administrators and with research staff and equipment in the pedagogical institutes.

Some of the education research projects or themes on which various higher educational institutions will be working during the 1976–80 period, according to the Coordination Plan of the Scientific-Research Institute on Problems of the Higher School, are the following:

Research Theme	*Institutions*
Problems of production (industrial) training in the higher school.	Tomsk University; Tula Polytechnical Institute.
Principles of individualized instruction.	Branch of Kazan Engineering-Construction Institute.
Problems of adaptation of first-year students.	Kuban University; Tula Polytechnical Institute.
Principles and method of programed instruction.	Voronezh Engineering-Construction and Technological Institutes; Moscow Automotive Institute; Novopolotsk Polytechnical Institute; Belorussian Technological Institute.
Problems of developing programed materials for foreign languages.	Moscow State Pedagogical Institute of Foreign Languages; Novocherkassk and Krasnoyarsk Polytechnical Institutes; and others.
Problems of building systems for data transmission in automated management systems of higher schools.	Kiev Institute of Engineers of Civil Aviation; Kazan Polytechnical Institute.
Means, forms, and methods of Communist upbringing in *VUZy*.	Tashkent, Tomsk, and Belorussian Universities.

[17] Ibid., p. 41.

It is interesting to note in the cases cited the combination of universities, technical institutes, and pedagogical institutes working on the same education research problems. In other cases, a combination of institutions will work on a theme also being researched by the Institute for Problems of the Higher School, and in economic, medical, and agricultural institutes. Because of an institution's primary concern with its own field and the sometimes competing interests of different Government ministries controlling various types of higher education institutions, research coordination by these institutions, beyond reporting general themes and the integrated collection of their reports, is a difficult and continuing problem.

3. Innovation

Programs for the Gifted in Science and Mathematics

Special school programs for children gifted in the arts—painting, music, dance, drama—have existed for a long time in the U.S.S.R.[1] In more recent years, special schools for the gifted in science and mathematics have been established. Two major aspects of this innovation are identifying these gifted children through academic "Olympiads" and their training in the special secondary schools.

Mathematics competitions among school students, called Olympiads, started in the 1930's in Leningrad. (Music and art Olympiads had started in the same city in the 1920's.) Since the 1960's, these competitions have been not only urban but also regionwide and Republic-wide throughout the U.S.S.R.

Since 1967, all-union (nationwide) Olympiads in physics, mathematics, and chemistry have been organized annually by a cooperative effort of Soviet education, youth, and labor organizations. These groups include the U.S.S.R. Ministry of Higher and Secondary Specialized Education, the Central Committee of the All-Union Komsomol (Communist Youth Organization), the All-Union Central Council of Trade Unions, and the All-Union "Znanie" (Knowledge) Society.[2]

State universities and branches of the U.S.S.R. Academy of Sciences play a role in organizing the regional and presumably also the Republic Olympiads, which are linked with special schools for training the winning students. To cite the example for which the most information is available, the Siberian Department of the U.S.S.R. Academy of Sciences and Novosibirsk University organized the All-Siberian regional school children's Olympiad in physics and mathematics.

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[1] These were described in a U.S. Office of Education publication by Mayo Bryce entitled "Fine Arts Education in the Soviet Union" (OE–14085). Washington, D.C.: U.S. Government Printing Office, 1963, 74 pp. See also "Education in the U.S.S.R.: An Annotated Bibliography of English-Language Materials 1965–1973," by Nellie Apanasewicz (OE 74–19111). Washington, D.C.: U.S. Government Printing Office, 1974, 92 pp. The latter also cites publications on out-of-school activities in the arts, sciences, and other fields. Such activities include children's theater, a children's scientific society, Pioneer palaces, *Komsomol* programs and camps (for youth), and People's Universities and Palaces of Culture (for adults).

[2] *Bolshaia Sovetskaia entsiklopediia* (Great Soviet Encyclopedia), vol. 18, p. 378 (Moscow, 3d ed.), 1974.

The Olympiad system in Siberia is described as follows by the head of the Siberian Department and Vice President of the U.S.S.R. Academy of Science:

> The arrangements are simple, on the whole. It was decided that there should be three rounds in an Olympiad. The first round is conducted by mail. Problems suggested by the Olympiad Organizing Committee are printed in the Siberian young people's newspapers, and anybody who wants to see how much he knows can try to solve them. In preparing the problems, we try to construct them in such a way as to pick out the children who can think unconventionally, clearly and originally. To enter the second round, for instance, there is no need at all for a child to solve all the problems that have been set. Sometimes a child who had solved only one of them, but has done so cleverly and originally, has been allowed to enter it; for I repeat, what is important for us in the final analysis is the child's ability to think. The winners in the first round are awarded certificates and prizes, and enter for the second round (which is more difficult). The second round is conducted in the big cities of Siberia, and members of the Siberian Department of the Academy of Sciences travel to these cities. The problems set are of course more complex. If the organizers of the round are impressed by a particular pupil, they talk to him very seriously about the choice of his future career.
>
> The winners of the second round come to the academic centre in Novosibirsk; here they have a holiday at a special summer camp, and at the same time prepare for round three. They meet eminent scientists—mathematicians, physicists, and chemists—attend their lectures, go to the theatre, visit scientific research establishments, and make the acquaintance of the people who are breaking ground in science today; in brief, they experience something of the atmosphere of a great scientific team. The third round is the most difficult. The problems are extremely complex, and their primary purpose is to select children who are not only gifted but able to think for themselves.[3]

More than 10,000 students age 15 or over, from Siberia, Soviet Central Asia, and the Soviet Far East, take part annually in the first round of the Siberian Olympiad. Under 600 reach the third and final round, and perhaps 100 to 150 emerge as winners of the Olympiad.

The winners of the Siberian Olympiad, along with some from the All-Union Olympiads, become students at the special secondary physics and mathematics boarding school affiliated with Novosibirsk State University, in nearby *Akademgorodok* (literally, "Academic Town," also referred to as "Science City"). The school curriculum provides a general education covering much more content in mathematics and the physical sciences than do regular Soviet secondary schools. As in regular secondary schools, students of the special school attend classes in compulsory subjects for 30 hours a week, but in a 5-day rather than the regular 6-day school week. On Saturdays, students of the special school study independently or work in research institutes or laboratories. Aside from classes under the regular teaching staff, lectures are given during and after school hours by university staff and science researchers.

Of the 2,000-plus graduates of the school since its establishment in the early 1960's, 80 percent have gone on to study at Novosibirsk State University; the remainder have enrolled at Moscow and Leningrad State

[3] Mikhail Lavrent'ev, "A School for Young Mathematicians in Siberia," in *Prospects*, vol. 5, no. 2, 1975, pp. 153–154.

Universities and other postsecondary institutions. Following university study, many have continued with graduate work and research at institutes of the U.S.S.R. Academy of Sciences. Some have returned to become teachers at the special school itself.

To cite another example, this time in a Soviet Republic rather than a region, the Kazakh SSR Council of Ministers in 1968 resolved to establish a special secondary physics-mathematics school in the capital city (Alma-Ata) of that largest Soviet Republic of Central Asia. The Kazakh Ministry of Education, jointly with the Republic's Academy of Sciences, conducted the competition. The first round attracted 17,000 students. About 700 reached the third and final round.[4] The number of students admitted to the school is not indicated, but apparently the figure was about 150 to 200.

In both Siberia and the Kazakh SSR, concern has been expressed about the need to develop the talents of a broader group of students than those admitted to the special schools. As a result, correspondence courses were set up in Siberia, and planned in the Kazakh SSR, to provide continuing contact with and stimulation to students gifted in physics and mathematics who remained in their regular secondary schools.

Students talented in the physical sciences are also being encouraged throughout the U.S.S.R. in recently introduced courses and clubs within the schools, and in the "Pioneer Palaces" and "Young Technicians' Centers," particularly in the largest cities like Moscow, Leningrad, and Kiev. In Simferopol, Crimea (in the Ukrainian SSR), a junior Academy of Sciences has been developed for talented teenagers. Scientists from major cities come to lecture in the summer, and students are assigned a range of standard scientific tasks, writing research papers, designing instruments, conducting laboratory research, and delivering science lectures.[5]

Combining of Vocational and General Education

Compulsory general education of 8 years is followed by three alternative types of formal education in the U.S.S.R., each under the overall control of a separate Government agency (two ministries and a state committee) of the U.S.S.R. Council of Ministers. (See "Introduction.") Each type includes elements of both general and vocational education, but their emphases and their levels and types of training vary considerably.

The combining of general and vocational education became an important element (termed "polytechnical education with labor training") in the schools of general education in the early 1960's. The combining was

[4] A. Taimanov. "In Search of Talent," *Kazakhstanskaia pravda* (Kazakhstan Truth), Aug. 29, 1969 (U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs," no. 31, Oct. 8, 1969, pp. 129–131).

[5] Aleksandr Adamenko. "Treasury of Surprises," *Ukraina* (Ukraine), no. 38, September 1970 (U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs," no. 164, July 27, 1971, pp. 57–59).

a consistent element of the secondary specialized schools (generally called *tekhnikumi*), and most recently has become an important trend in the upgrading of many vocational schools into "secondary vocational schools" in the 1970's. Taken together, these three types of schools provide the great majority of secondary level students with some combination of academic and career education.

Schools of General Education

Several years of experimenting and testing in the schools under the research institutes of the Academy of Pedagogical Sciences led in 1959 to a major curricular change in the schools of general education throughout the country. Polytechnical education and elements of vocational education were combined with general education in the standard curriculum of the schools, and the duration of elementary-secondary education was lengthened from 10 to 11 years. This extension allowed about one-third of the total time in the last 3 school years for labor training or "production training." While polytechnical education provided a practical component in the regular academic school subjects, primarily in the sciences, and acquainted students in a general way with the world of work, labor training involved actual work in the factory or on the farm.

By 1964, this system of combined study and work had broken down for various reasons, including the indifference of factory personnel, misuse of students at the factories, overloading of students with academic and practical work, and inadequacy of facilities and staff training for this massive effort.[6] The vocational component of the curriculum was reduced and its duration returned to 10 rather than 11 years. Polytechnical education has been maintained, but with a considerable reduction of labor training. The latter takes place now primarily in the schools unless there are adequate local factory facilities, and labor training no longer is a substantial portion of the required curriculum. Innovation in schools of general education has moved in the direction of modernizing the science and mathematics curriculum and increasing the hours of optional subjects, which offer students the choice of taking advanced or remedial science and other subjects or of pursuing further labor training.

Table 3 shows the current curriculum in general education schools.

Vocational Schools

In the late 1960's, Soviet vocational schools began to be upgraded. The objective was to convert increasing numbers of these schools, which train skilled workers in over a thousand specialties, into "secondary voca-

[6] For details see the author's "Significant Aspects of Soviet Education" (OE–14112), Bulletin 1965, no. 15. Washington, D.C.: U.S. Government Printing Office, 1965, and his "U.S.S.R.: Recent Major Curriculum Changes," in *Strategies for Curriculum Change: Cases From 13 Nations*. Thomas, Sands and Brubaker, Scranton, Pa.: International Textbook Co., 1968.

Table 3.—Standard general education school curriculum: Grades 1–10

Subjects	Number of hours per week by grade									
	1	2	3	4	5	6	7	8	9	10
Total	24	24	24	24	30	30	30	30	30	30
Art	1	1	1	1	1	1				
Astronomy										1
Biology					2	2	2	2	0/2	2
Chemistry							2	2	3	3
Foreign language					4	3	3	2	2	2
Geography					2	3	2	2	2	
History				2	2	2	2	3	4	3
Literature				2	2	2	2	3	4	3
Mathematics	6	6	6	6	6	6	6	6	5	5
Mechanical drawing						1	1	1		
Nature study		2	2	2						
Physical training	2	2	2	2	2	2	2	2	2	2
Physics						2	2	3	4	5
Russian grammer	12	10	10	6	6	3	3	2	2/0	
Shop	2	2	2	2	2	2	2	2	2	2
Singing and music appreciation	1	1	1	1	1	1	1			
Social sciences										2

Source: N. P. Kuzin et al., "Education in the U.S.S.R." Moscow: Progress Publishers, 1972, p. 38. Double entries separated by a diagonal line indicate number of hours per week in first and second semester, where they differ.

tional schools" that would add a general education component to vocational education, thus providing a "complete secondary" education. This goal was in line with the acknowledged need for increasingly educated workers in a technologically developing society, as well as with the general objective of providing universal complete secondary education (through grade 10) throughout the Soviet school system by the mid 1970's.

The enrollment increase in these new secondary vocational schools during the 1970's is compared in official Soviet statistics with the static condition of enrollments in regular vocational schools:[7]

[7] 1969–70 statistics and goal for 1975 are from the mimeographed U.S.S.R. report to the XXXII Session of the International Conference on Education (Geneva, July 1970). The report is entitled "On the Main Trends in the Field of Education in the U.S.S.R. in 1968–1970." The 1970–71 to 1974–75 statistics are from *Narodnoe khoziastvo SSSR* v. *1974* (National Economy of the U.S.S.R. in 1974), published by the Central Statistical Administration, Moscow, 1975.

(In millions)

	1969–1970	1970–1971	1971–1972	1972–1973	1973–1974	1974–1975
Vocational schools	2.3	2.4	2.4	2.4	2.4	2.3
Secondary vocational schools	.06	.2	.3	.5	.7	1.0

The success of these secondary vocational schools is suggested not only by periodic official endorsements, but also by the substantial increase in enrollments to one million in 1974–75, far exceeding the goal set in 1970 for 1975, which was only 300 to 400 thousand.

Curricular innovations to upgrade vocational schools affect a substantial number, although a rather small percentage, of those completing some form of secondary education. The new secondary vocational schools serve those who are less academically inclined than general education students and less technically inclined than secondary specialized students.

The 3-year program of the secondary vocational schools (shown in table 4), called *srednie professional'ne-tekhnicheskie uchilishcha,* is longer than that of the regular vocational schools, which are called simply *professional'ne-teknicheskie uchilishcha* (without the *srednie,* meaning "secondary"). The duration of program of regular vocational schools may be 1 or 2 years, or even as short as 6 months.

Secondary Specialized Schools

The 3- to 4-year curriculum of the secondary specialized schools, or *tekhnikumi,* resembles the 3-year secondary vocational school curriculum both in having a substantial vocational-technical cycle and a general education cycle (taken together as part of one program of studies) and also in providing a vocational specialty as well as a secondary school diploma. (See table 5.) The major difference is that secondary specialized schools provide a more advanced level of training that produces technicians rather than skilled workers. Admission to these schools is preceded by initial screening through competitive examinations. Unlike secondary vocational schools, secondary specialized schools also have a foreign language requirement, which would increase their graduating students' preparation for possible higher education.

Enrollments for 1974–75 in the 3 to 4 years of secondary specialized schools totaled 4.5 million, or about one-fourth of the 16.5 million students engaged in some form of complete secondary education in the U.S.S.R. Enrollments in secondary vocational schools totaled 1 million, or about one-sixteenth of the total, with the remainder (11 million) composed of general education students in grades 9 and 10.

Table 4.—Sample secondary vocational school curriculum: 3-year course for skilled worker (electrician) with secondary education [1]

Subjects by cycle [2]	Number of hours per week by year [3]		
	1	2	3
Total, both cycles	36	36	36
Vocational-technical cycle	19	23/22	24
Basic economics of labor and production			2
Electrical material studies	1		
Electrotechnic with basic industrial electronics	0/1	5/2	
Industrial training	12	12	18
Mechanical drawing	2/1		
Physical education	2	2	2
Primary military training		2	2
Special technology	2	2/4	
General education cycle	17	13/14	12
Astronomy			0/2
Biology			2/0
Chemistry	3	3/2	
Geography	1		
History	2/3	2/3	2/1
Mathematics	4	4/3	2/3
Physics	5/4	2	2/3
Russian language and literature	2	2/3	2
Social Science		0/1	2/1

[1] In addition to compulsory subjects presented here, students may take a total of 190 hours of optional subjects. Double entries separated by a diagonal line indicate number of hours per week in first and second half of year, where they differ. Upon conclusion of the program of studies, an additional 14 weeks in the third year are devoted to full-time industrial training (41 hours per week).

[2] "Cycles" in the Soviet system refer to two different groups of subjects taken as part of one program of studies.

[3] Of 39 weeks.

Source: *Uchebnyi plan i programmy dlia podgotovki v professional' notekhnicheskikh uchilishchakh kvalifitsirovannykh rabochikh so srednim obrazovaniem: professiia—elektromonter po obsluzhivaniiu elektrooborudovaniia* (Curriculum and Syllabi for Training in Vocational-Technical Schools of Qualified Workers with Secondary Education: Vocation—Electrician for Servicing Electrical Equipment), published by the State Committee for Vocational-Technical Education, U.S.S.R. Council of Ministers, Moscow, 1972.

Table 5.—Sample secondary specialized school curriculum: 3½-year course for *feldsher* (physician's assistant)

Cycles [2] and subjects	Hours for entire course [1]		
	Total	In class	Laboratory and practical work
General education cycle:			
Chemistry	156	110	46
Foreign language	170	170	
History	170	170	
Literature	188	188	
Mathematics	300	300	
Physics	194	166	28
Principles of scientific atheism	16	16	
Social studies	68	68	
General medical cycle:			
Anatomy	154	112	42
Biology	78	60	18
Health care organization	36	20	16
Hygiene	68	50	18
Latin	76	76	
Microbiology	80	58	22
Pathological anatomy and pathological physiology	95	70	25
Pharmacy and prescription writing	163	121	42
Physiology	100	74	26
Special cycle:			
Diseases of ears, nose, and throat	64	26	38
Diseases of teeth and oral cavity	48	24	24
Epidemiology	90	40	50
Eye diseases	64	26	38
Infectious diseases	154	84	70
International medicine and patient care	390	170	220
Nervous and emotional disturbances	72	32	40
Obstetrics/gynecology	290	120	170

See footnotes at end of table.

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Table 5.—Sample secondary specialized school curriculum: 3½-year course for *feldsher* (physician's assistant)—Continued

Cycles [2] and subjects	Hours for entire course [1]		
	Total	In class	Laboratory and practical work
Special cycle—Continued			
Pathology clinical manifestation therapy of RV & OV	48	28	20
Pediatrics	218	106	112
Physiotherapy, massage, and therapeutic physical culture	96	36	60
Skin and venereal diseases	72	32	40
Study of additional teaching materials	55	55	
Surgery	247	147	100
Physical education		202	
Civil defense		34	
Optional:			
Consultation on special subjects		60	
Physical education		137	
Russian or native language		118	

[1] Information is not available on the number of hours per week by year for each subject in the curriculum.

[2] "Cycles" in the Soviet system refer to different groups of subjects taken as part of one program of studies.

Source: Storey, Patrick B. (M.D.), *The Soviet Feldsher as a Physician's Assistant*. DHEW (NIH) 72-58, February 1972, p. 13.

Management Training in Higher Education

Admission and enrollments in higher education in the U.S.S.R. are controlled by a list of specific specialties or fields of study. This list is issued by the U.S.S.R. Ministry of Higher and Secondary Specialized Education in conformity with the economic plans of the Party and Government, the production demands placed on the industrial establishment, and the coordination of manpower planning by *Gosplan*, the State Planning Committee, and other Government agencies. The list of over 300 specialties has long neglected management (*upravlenie*) as a diploma-granting field of higher education. This is in contrast to the United States. Business and public administration are well established as separate

specialties, and formal, degree-granting courses of study in these fields are fairly widespread in higher education institutions throughout the United States.

By 1975 the official list of higher education specialties included a number of management specialties that were not present in the late 1960's.[8] These were the new 4-digit "1745" to "1751" series of specialties in "organization of management of production" for various industrial and related fields: sequentially, for (1) the government-run machine building industry, (2) the metallurgical industry, (3) the chemical industry, and (4) construction, municipal services, automobile transport, and hydroelectric power. Students in these specialties graduate as qualified "engineer-economists for organization of management." Another new management-related specialty (in engineering) was Automation of Fuel Processes ("0649"), with the subspecialty Automated Systems of Management by Objectives of Industrial Enterprises.

Elements of management training had been present in higher education specialties not specifically labeled "management" in the 1960's, such as economic planning and economics and organization of various industries. In the early 1970's, however, the Soviets showed an increasing concern for training specialists in management in a more substantive way in higher education.

In July 1972 the CPSU (Communist Party of the Soviet Union) Central Committee and the U.S.S.R. Council of Ministers adopted a resolution "On Measures for Further Improving Higher Education in the Country." Among a number of other measures, *Pravda* noted:

> The U.S.S.R. Ministry of Higher and Secondary Specialized Education, together with the U.S.S.R. Academy of Sciences and appropriate ministries and departments, has been given the task of implementing measures during the period 1972–74 to improve the training plans and syllabuses of *VUZy* [Higher Education Institutions] in the direction of stepping up the training of students in general scientific and general technical disciplines, in the direction of conducting practical work taking into account the modern requirements of science and production, and in the direction of improving the training of specialties in the sphere of the scientific organization of labor and management, engineering psychology, industrial arts and computers.[9]

In a *Pravda* article in February 1975, U.S.S.R. Minister of Higher and Secondary Specialized Education V. Elyutin noted:

> New VUZ departments specializing in the training of specialist production organizers and leaders (i.e., industrial managers) are being opened, and elsewhere training plans and programs are being modified to produce men who not only have a command of general scientific and production (practical) knowledge but who also have the ability to assess the importance of new investigations and discoveries and to organize and carry these through into practice.[10]

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[8] Lists have been composed in K. Nozhko, et al., "Educational Planning in the U.S.S.R.," UNESCO, Paris, 1968, pp. 188–196, and *Bulleten' Ministerstva vysshego i srednego spetsial'nogo abrazovanniia S.S.S.R.*, Moscow, December 1975, pp. 2–29.

[9] *Pravda*, July 30, 1972. (FBIS *Daily Report, Soviet Union*, July 31, 1972, p. 515.)

[10] *Pravda*, Feb. 28, 1975. (FBIS *Daily Report, Soviet Union*, Mar. 7, 1975, p. 17.)

One example of such a modification is in the old, established Ordzhonikidze Institute of Engineering and Economics in Moscow. In March 1975 its name was changed to the "Institute of Management," *Institut Upravleniia,* and by September 1975 a new campus was under construction. Some concerns of the newly named institute are establishing models and information systems for providing a scientific basis to management, developing teaching by the case method, and training students in problem solving through practical use of computers in courses in automated management systems.

In October 1976 its Vice Rector P. A. Kolesnikov indicated that the institute had shifted 4 years ago from an economics institute to training engineers to become managers, and another institute like it was being planned for the future. Employer-enterprise demand for graduates was heavy, with prospective employers (80 percent in Moscow) sending persons to the institute to interview seniors—a familiar method of recruitment in the United States, but apparently novel in the Soviet Union. Graduates begin work as junior executives in research and planning institutes, administrative offices of government (industrial) ministries, and in plants and factories.

Other Soviet higher education institutions are developing innovative management training programs: the Plekhanov Institute of National Economy in Moscow, the Voznesenskii Institute of Finance and Economics in Leningrad, and the Polytechnical Institutes in Riga and Tallin. There is considerable Soviet interest in the U.S. higher education experience in training top managers, since such innovations as the case method and management games (called "collective decision games") are in the experimental stage in the U.S.S.R., and the prevailing method of management education remains the lecture with supporting reading assignments.[11]

Other Innovations in Soviet Education

Some other innovations in Soviet education that have been developed since the 1960's and may be of particular interest to the U.S. reader will be noted here briefly.

National Preschool Syllabus

In May 1959 a new, voluntary type of preschool institution was established in the U.S.S.R., the combined nursery-kindergarten (*iasli-sad*), for the care, upbringing, and education of children from infancy to the age at which they enter the first grade (i.e., from about 3 months to about

[11] The author was provided with some materials related to Soviet management training by D. D. Aufenkamp of the National Science Foundation (NSF). The information in the last paragraph is based on the NSF's Trip Report of U.S. Delegation on "Computer-Aided Refinement of Decision-Making and Education of High-Level Executives" to the U.S.S.R., Sept. 18–30, 1975.

7 years of age). The first national syllabus detailing the program of instruction for each age group (3 months to 1 year, and year by year to age 7) was published in 1962 and revised in 1965 and 1971.[12] The syllabus provides a daily schedule of activities for children at home as well as in the nursery-kindergarten according to age group. It is concerned with physical, emotional, and mental development, and deals with such specifics as hygiene, enjoyment of work, and speech development. For each age group, the objectives in care and instruction precede the details of scheduling.

The 1971 syllabus showed increasing concern in the final year of kindergarten with preparing 6-year-olds for school. This concern arose in connection with the recent reduction of primary education from 4 years (grades 1–4) to 3 years (grades 1–3) in the new school curriculums, requiring better preparation of primary school entrants for the more substantial content of the first three grades, now compressed into 3 years instead of 4.

There has been some discussion among Soviet educators of the possibility of beginning first grade at age 6, rather than 7. Some other developments that are leading Soviet education toward a closer resemblance to widespread Western patterns of contemporary education include the recent drive to reduce rote memorization, to increase "ability to think" in the classroom, to use electives in high school curriculums, and to consider short-cycle higher education as a possible supplement to the existing system.

Special Foreign Language Schools

In the early 1960's, selected schools of general education (grades 1–10) specializing in foreign languages were established in the U.S.S.R. About 200 of these schools were reported to be in the Russian S.F.S.R. (Soviet Federated Socialist Republic, the largest of the 15 Soviet Republics) in 1964, and about 800 reported through the U.S.S.R. in 1972.[13] Most are located in the largest Soviet cities.

Literally, the schools are called "general education schools with teaching of a number of subjects in a foreign language" (*obshcheobrazovatel'nye shkoly s prepodavaniem riada predmetov na inostrannykh iazykakh*). Teaching is both in Russian and, in most cases, a Western language, usually either English, German, French, or Spanish. In some

[12] The 1965 edition was translated into English as "Soviet Preschool Education, vol. I, Program of Instruction," by the Education Testing Service (New York: Holt, Rinehart and Winston, Inc., 1969).

[13] The 1964 statistic is from *Pedagogicheskaia entsiklopediia* (Pedagogical Encyclopedia) vol. II (of 4 volumes), I. A. Kairov et al., eds. (Moscow: "Sovetskaia entsiklopediia" Publishers, 1965), p. 238. The section of the encyclopedia found pp. 235–46 concerned with a history and outline of foreign language teaching in Soviet schools. The 1972 statistic is from "Impressions of Soviet Education: A Second Look," published by the Educational Staff Seminar (ESS) of George Washington University (Washington, D.C.), p. 48.

schools teaching is in an Eastern language such as Hindi, rather than in a Western language.

Unlike the regular Soviet schools of general education, which begin teaching a foreign language in the fifth grade, these special schools begin the foreign language in the first or second grade. It is taught 3 hours per week in grades 1 through 4, and 6 hours in grades 5 through 10; the latter is about twice as much as in the regular Soviet schools in grades 5 to 7 and three times as much as in grades 8 to 10.

With some variation from one school to another, certain other subjects such as world geography, history, and natural science or biology may be taught in the foreign language beginning in the sixth grade. Physics may be taught in the foreign language from the seventh grade, and the literature of the foreign country concerned from the eighth grade. All subjects are taught within the framework of Communist ideology. The texts for these courses are written in the foreign language, and both students and teachers are supposed to speak the foreign language in the classroom.[14]

The curriculum is geared to achieving near fluency in a foreign language in order to prepare students to use it for career purposes. Not surprisingly, the special schools are considered to do a more effective job of language teaching than the regular general schools. The students in these foreign language schools appear to be the children of professionals and influential officials,[15] generally admitted from the neighborhoods in which the schools are located. Classes are divided into small groups for intensive foreign language instruction. Upon completion of the program, students are better prepared for the competitive foreign language exams required for entry into select higher education institutions. In the long run, they have a head start toward following college careers utilizing foreign languages; e.g., in international relations, trade, teaching, interpreting, and technical and scientific research.

The teaching staff at these schools may be trained at one of the dozen specialized higher education "Pedagogical Institutes of Foreign Languages" (*Pedagogicheskie instituty inostrannykh iazykov*) in the U.S.S.R. or in the foreign language department of one of the universities or "State Pedagogical Institutes"—the Soviet teachers colleges.

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[14] For a detailed discussion of the curriculum of these schools and materials used in the foreign language classes, see "Soviet Approaches to Bilingual Education," by Diana E. Bartley. (Philadelphia: Center for Curriculum Development, Inc., 1971.) Participants of George Washington University's Educational Staff Seminar (Washington, D.C.), after surveying schools in the U.S.S.R. during periodic study tours, describe the special English language schools they observed in the seminar's reports "Impressions of Education in the USSR" (1971) and "Impressions of Soviet Education" (1975).

[15] Ibid., Bartley, p. 264, and Educational Staff Seminar (1971), p. 16. Bartley and the ESS draw similar conclusions from visits to these schools, related discussions, and informal polling of students. This author has the same impression from his own visits to the schools. The U.S.S.R. has published no statistics comparing the enrollment of the children of professionals and those of workers in these schools.

Preparatory Departments for Higher Education

In August 1969, the CPSU Central Committee and the U.S.S.R. Council of Ministers issued a decree "On the Organization of Preparatory Departments At Higher Education Institutions." [16] The objective was to raise the level of general educational preparation of industrial workers and rural youth sufficiently so that increasing numbers of these groups could be enrolled in higher education. General education in rural areas in particular has been criticized over the years as qualitatively inferior to urban education. Rural areas, which still contained 40 percent of the population in 1975, may be considered the largest source of disadvantaged youth in the U.S.S.R.

Preparatory departments were begun in various types of higher educational institutions (*VUZy*), technical and other specialized institutions, and universities in the 1969–70 academic year. By 1976 it was reported that 606 out of 854 *VUZy* boasted preparatory courses training almost 100,000 students annually, and the goal "in the near future" was to train in preparatory courses 20 percent of all new students enrolling in higher education annually.[17]

According to the "Regulations on the Preparatory Department at the *VUZ*," the preparatory department accepts "front-rank workers, collective farmers, and demobilized servicemen" who have completed secondary education. The workers and farmers must have been at practical work not less than 1 year.[18] Another source, concerned specifically with medical schools, indicates that other groups are admitted as well.

> The fact that, in addition to workers and collective farmers, junior medical personnel (nurses and orderlies with at least two years of practical experience) have been admitted to the preparatory departments is very important. First, the majority of representatives in this category have quite a clear understanding of their future profession and enter medical institutes with full awareness and in response to a calling. Second, to a certain extent such a measure for encouraging junior medical personnel makes it possible to solve the problem of attracting more young people to fill vacant positions as nurses and orderlies. Third, medical institutions receive well-trained junior-level personnel.[19]

This source notes that a special number of places is set aside in the medical school preparatory departments for youth from agricultural regions that urgently need physicians.

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[16] Decree No. 681 of Aug. 20, 1969.

[17] V. M. Kuznetsov and A. V. Filippov of the National Research Institute for Higher Education, Moscow, 1976, in an unpublished paper entitled "Methods of Direct (Short-Term) and Extended (Long-Term) Selection of Students for Enrollment in Institutions of Higher Learning."

[18] A. G. Lebedev, RSFSR First Deputy Minister of Higher and Secondary Specialized Education, *Moskovskaia pravada* (Moscow Truth), Nov. 1, 1969 (U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs," Dec. 9, 1969, pp. 73–75). See also U.S. JPRS' "Translations," Sept. 16, 1969, pp. 68–71.

[19] S. Ia. Chikin. *Vysshaia meditsinskaia shkola v S.S.S.R.* (Higher Medical School in the U.S.S.R.), Moscow, "Meditsina" Publishers, 1973 (translated as "Medical School in the U.S.S.R.," May–June 1975 issue of *Soviet Education* (International Arts & Sciences Press), p. 33.

Preparatory courses are given for about 1 school year—8 months full time and 10 months part time (evening or correspondence-extension). These are conducted primarily by instructors of the *VUZ* concerned, and much of the preparation is geared specifically to the background students need for the particular higher education specialty in which they will be enrolled. Upon completing preparatory studies, students take final examinations given by a commission of *VUZ* instructors and professors and heads of preparatory departments. If successful, the students are admitted to the first year of higher education without taking the regular competitive entrance examinations.

In practice, the preparatory departments have had a number of problems—poor planning and coordination of guidance counseling prior to selection of applicants, occasional use of the program to get rid of undesired workers or collective farmers, inadequate instructors and instruction methods, and a high rate of dropouts.[20]

Some of these problems may be ascribed to the growing pains of a new institution, however, and it is evident that the Soviet Government continues to view the preparatory departments as an important vehicle for equalizing education opportunity for its disadvantaged youth.

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[20] L. Oprishenko and Iu. Shylovtsev. "Preparatory Schools: Objectives and Problems," *Radyanska Ukraina* (Ukrainian Herald), Dec. 10, 1970 (U.S. JPRS' "Translations on U.S.S.R. Political and Sociological Affairs," July 27, 1971, pp. 54–56).

4. Summary and Conclusions

As the Soviet national economy has long had its overall 5-year state economic plans, so educational research in the U.S.S.R. now has its 5-year Coordination Plans, both in the Academy of Pedagogical Sciences and in the Institute on Problems of the Higher School. The current plans in both of these major research organizations are for the period 1976–80 and involve thousands of education research projects and researchers in hundreds of education and research institutions.

Some of the significant subjects of recent or current research are preparation of modernized curriculums and textbooks, teaching of elective courses, vocational guidance, problems of adult education, development of technical aids to instruction, problems of youth upbringing, the psychology and physiology of students, and automated administration systems.

While proposals for research may come from any level, the decision to pursue a major line of education research generally proceeds through the various organizations in the following order:

Communist Party leadership and organization
U.S.S.R. Council of Ministers
U.S.S.R. Ministry of Education or U.S.S.R. Ministry of Higher and Secondary Specialized Education
Academy of Pedagogical Sciences or Institute on Problems of the Higher School
Research institutes and experimental schools

Other organizations that might play a role include the State Planning Committee (*Gosplan*), the Communist youth organization (*Komsomol*), the Trade Union of Workers of Education, Higher Schools and Scientific Organizations, the U.S.S.R. Academy of Sciences or other academies and their research institutes, and various industrial and other Government ministries.

Although innovative programs do not necessarily follow research findings, a flow chart may be drawn up, based on the structure of the Soviet education system, that demonstrates the usual sequence for converting education research conclusions to innovative practices, and selective experimentation to general application in the elementary-secondary schools:

Research institutes and experimental schools
Academy of Pedagogical Sciences
U.S.S.R. Ministry of Education
15 Republic Ministries of Education
City or regional departments of education
District departments of education
Schools throughout the U.S.S.R.

For higher education, the line from research to innovation normally would be:

Selected higher education institutions (*VUZy*)
Scientific-Research Institute on Problems of the Higher School
U.S.S.R. Ministry of Higher and Secondary Specialized Education
Fifteen Republic Ministries of Higher and Secondary Specialized Education
Various ministries administering the *VUZy*
The VUZy

Education innovations in recent years have ranged from those that affect relatively few students, such as programs for the gifted in science and mathematics, special foreign language schools, and management training in higher education, to those that are designed to affect hundreds of thousands to millions of students. In the latter category are the national preschool syllabuses and the various forms of combining vocational and general education, the latest being the complete secondary vocational schools and, potentially, the preparatory departments for increasing the opportunity for admission to higher education for less qualified youth. When fully implemented, the preparatory program could affect up to 200,000 enrollees annually.

The primary criterion for innovation in the Soviet system is not the number of students served but the utility of the programs in servicing the needs of the state, in strengthening the scientific and economic base of the system within the framework of the Communist ideology and Communist leadership decisions.

Weaknesses may be noted in education research in the U.S.S.R., including the preponderance of descriptive reporting of pedagogical practice over rigorous experimental investigation, and the difficulty of involving institutions in the pursuit of significant research problems. Aware of these problems, the Soviet Government bodies concerned have reduced a heterogeneous mass of projects to a smaller number of priority research problems, and have focused and coordinated research more tightly through Coordination Plans and the recently formed Scientific Research Institute on Problems of the Higher School.

Some major mistakes have been made in innovation in the educational system despite periods of testing in experimental schools, the most notable being the major effort to combine vocational and polytechnical education in the schools of general education in the early 1960's. Lessons have been learned from experience, however, resulting in this case in new combinations such as the secondary vocational schools, which represent an upgrading of the general education component.

In the future, as the institutions concerned with education research and innovation develop more effective means for measuring school and student performance, there can be expected to be further refinement of the goals, the objectives, and the specific projects in the various fields, in conformity with the emerging demands of the state.

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